Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 (Currently Amended). An ink composition for printing on a glass substrate, to be fused to the substrate upon firing, the ink characterized by:

(a) having viscosity, below 20_cps at jetting temperature and having 39-50% solids content; and

(b) becoming an integral part of the substrate upon exposure to temperatures above 500°C and below 700°C;

the ink composition comprising :

1) a ~~non-wax~~ vehicle being a liquid at ~~room temperature~~15°C; and

2) sub-micron particles of binding composition.

2 (Currently Amended). The ink composition according to claim 1, the ink further characterized by:

(c) maintaining optical properties after exposure to temperatures above 500°C;

the ink composition further comprising:

3) particles of heat resistant inorganic pigment having an average size of less than 1.2 microns~~;~~

~~:~~

3 (Original). The ink composition of claim 2 wherein the heat resistant inorganic pigments are metal oxides.

4 (Original). The ink composition of claim 2, wherein the particles of inorganic pigment have an average size less than 0.9 microns.

5 (Original). The ink composition of claim 4, wherein the average size of the particles of the inorganic pigment is less than 0.7 microns.

6 (Previously Presented). The ink composition of claim 5, wherein the average size of the particles of the inorganic pigment is less than 0.55 microns.

7 (Currently Amended). The ink composition of claim 2 wherein the inorganic pigments are selected ~~from:~~from the group consisting of chromium oxide, copper oxide, titanium oxide, Cu-Cr_2O_3 oxides~~;~~, titanium dioxide, iron oxide, ~~Nickel~~ nickel

antimony titanium yellow rutile, ~~Cobalt aluminium~~cobalt aluminum blue spinel~~;~~, and combinations of two or more of the above.

8 (Previously Presented). The ink composition of claim 1 wherein the liquid vehicle is at least one organic solvent.

9 (Currently Amended). The ink composition according to claim 8 wherein the at least one organic solvent is selected from the group consisting of PM (propylene glycol mono methyl ether), DPM (dipropylene glycol mono methyl ether), TPM (tripropylene glycol mono methyl ether), PnB (propylene glycol mono n-butyl ether), DPnB (dipropylene glycol mono butyl ether), TPnB (tripropylene glycol mono n-butyl ether), PnP (propylene glycol mono propyl ether), DPnP (dipropylene glycol mono propyl ether), TPnB-H (propylene glycol butyl ether), PMA (propylene glycol mono methyl ether acetate), Dowanol DB (~~Diethylene~~ diethylene glycol mono butyl ether) ~~or~~ and other ethylene or propylene glycol ethers; or a combination of two or more ~~f~~ of the above.

10 (Currently Amended). The ink composition of claim 8 wherein the binding composition ~~are~~ comprises sub-micron particles of glass frit.

11 (Currently Amended). The ink composition of claim 10 wherein the glass frit is composed of ~~Si02, Bi203, and B203~~SiO_2, Bi_2O_3, and B_2O_3.

12 (Currently Amended). The ink composition of claim 1 wherein the w/w of the ~~Sio2~~ SiO_2 in the glass frit is 50-70%.

13 (Currently Amended). The ink composition of claim 11 wherein the w/w of the ~~Bi203~~ Bi_2O_3 in the glass frit is 10-20%.

14 (Currently Amended). The ink composition of claim 11 wherein the w/w of the ~~B203~~ B_2O_3 in the glass frit is 3-20%.

15 (Previously Presented). The ink composition of claim 8 further comprising at least one dispersant, or a combination of dispersants.

16 (Previously Presented). The ink composition of claim 8 further comprising at least one wetting agent.

17 (Previously Presented). The ink compositions according to claim 8 further comprising an organic polymeric binder.

18 (Currently Amended). The ink composition of claim 17 wherein the organic polymeric binder is a ~~polyacrylates~~ polyacrylate or ~~polyvynilpyrrolidone~~polyvinylpyrrolidone~~,~~ (PVP).

19 (Previously Presented). The ink composition of claim 8 further comprising at least one UV-curable agent.

20 (Currently Amended). The ink composition according to claim 19 wherein the ink curable agent is selected from the group consisting of photo-~~polymelizable~~ polymerizable monomers and photo-polymerizable oligomers.

21 (Currently Amended). The ink according to claim 20 further comprising at least one ~~of :~~ ~~photoinitiators,~~photoinitiator or ~~photosensitizers~~photosensitizer.

22 (Previously Presented). The ink composition of claim 1 wherein the liquid vehicle is water- based.

23 (Original). The ink composition of claim 22 wherein the binding composition comprises aqueous dispersion of silica nano-particles.

24 (Original). The ink composition of claim 23 further comprising an organic polymer.

25 (Previously presented). The ink composition of claim 22 comprising at least one water soluble agent for decreasing the sintering temperature of the sub-micron particles of binding composition .

26 (Original). The ink composition of claim 25 wherein the sintering temperature is decreased to a temperature below 700°C.

27 (Currently Amended). The ink composition of claim 25 wherein the water soluble agent is selected from~~: Boron~~the group consisting of boron (B) containing agents, ~~phosphates~~ phosphate containing agents, bismuth containing agents, and sodium ~~silicates~~ silicate containing agents, or combinations of the above.

28 (Currently Amended). The ink composition of claim 27 wherein the water soluble agent is selected from~~: Boric~~ the group consisting of boric acid, sodium ~~Perborate~~perborate, ~~Sodium~~

~~Tetraborate~~sodium tetraborate decahydrate and ~~Disodium Octaborate Tetrahydrate~~disodium octaborate tetrahydrate.

29 (Original). The ink composition of claim 24 wherein the organic polymers are water soluble or water dispersible organic polymers.

30 (Currently Amended). The ink composition of claim 29, wherein the organic polymer is selected from the group consisting of PVP (polyvinylpyrrolidone), acrylic colloidal dispersion, acrylic polymer emulsions, styrene-acrylic copolymer emulsion, and ~~or~~ combinations of the above.

31 (Currently Amended). The ink composition of claim 24 wherein the organic polymers are a colloidal system.

32 (Previously Presented). An ink composition according to claim 1 further comprising at least one additive.

33 (Currently Amended). An ink composition according to claim 32 wherein the additive is selected from~~:~~ the group consisting of wetting agents, dispersing agents, defoamers, humectants, rheology control agents, organic polymers as binders

and fixation ~~agents ,~~agents, anticorrosive agents, coalescent agents, pH control agents and biocides.

34 (Currently Amended). An ink composition according to claim 33 wherein the organic polymers as binders and fixation agents ~~are:~~are polyacrylates or ~~polyvynilpyrrolidone,~~polyvinylpyrrolidone (PVP).

35 (Currently Amended). An ink composition for printing on a ceramic substrate, to be fused to the substrate upon firing, the ink characterized by:

(a) having viscosity, below 20_cps at jetting temperature and having 39-50% solids content; and

(b) becoming an integral part of the substrate upon exposure to temperatures above 500°C;

the ink composition comprising:

1) a vehicle being a liquid at room temperature and comprising at least one organic solvent selected from the group consisting of PM (propylene glycol mono methyl ether), DPM (dipropylene glycol mono methyl ether), TPM (tripropylene glycol mono methyl ether), PnB (propylene glycol mono n-butyl ether), DPnB (dipropylene glycol mono butyl ether), TPnB

(tripropylene glycol mono n-butyl ether), PnP (propylene glycol mono propyl ether), DPnP (dipropylene glycol mono propyl ether), TPnB-H (propylene glycol butyl ether), PMA (propylene glycol mono methyl ether acetate), Dowanol DB (~~Diethylene~~ diethylene glycol mono butyl ether), ~~or~~ other ethylene or propylene glycol ~~ethers;~~ ethers, and a combination of two or more of the above listed solvents; and

2) sub-micron particles of binding composition.

36 (Withdrawn/Currently Amended). A method of printing on a ceramic substrate, the method comprising:

(a) preparing an ink composition which is liquid at room temperature, the ink composition comprising a vehicle and sub-micron particles of binding composition;

(b) applying the ink to the ceramic substrate at a viscosity~~,~~ below 20 cps; and

(c) firing the substrate at a temperature above 500oC so that the sub-micron particles become an integral part of the substrate.

37 (Withdrawn). A method of printing on a glass substrate, comprising:

ink jet printing a composition according to claim 1 onto the glass substrate to produce a pattern;

fixing the pattern to the substrate by application of energy; and firing said substrate at said temperature above 500°C and below 700 °C.

38 (Withdrawn). A method according to claim 37, wherein said energy is applied as heat energy.

39 (Withdrawn). A method according to claim 38, wherein said heat energy is provided as infrared (IR) radiation.

40 (Withdrawn) A method according to claim 38, wherein said heat energy is provided as warm air.

41 (Withdrawn). A method according to claim 38, wherein at least some of said heat energy is applied to said substrate prior to printing said pattern.

42 (Withdrawn). A method according to claim 38, wherein at least some of said heat energy is applied to said substrate subsequent to printing said pattern.

43 (Withdrawn/Currently Amended). A method of printing on a glass substrate, comprising:

ink jet printing a composition comprising a vehicle being a liquid at room temperature and having sub-micron particles of binding composition and having viscosity below 20 cps at jetting temperature onto the glass substrate to produce a pattern;

fixing the pattern to the substrate by application of energy; and

firing the substrate at a temperature above 500°C and below 700 °C so that the composition becomes an integral part of the substrate.